

Appl. No. 09/836,704

Amendment dated November 25, 2003

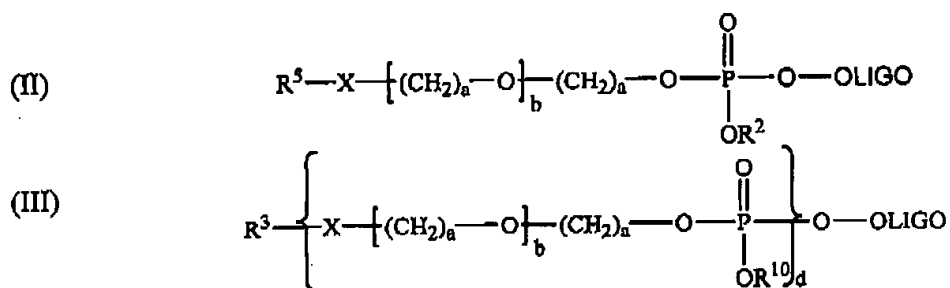
Reply to Final Office Action of June 26, 2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A mobility-modified sequence-specific nucleobase polymer comprising a mobility-modifying polymer linked to a sequence-specific nucleobase polymer, according to Structural formula (II) or (III):

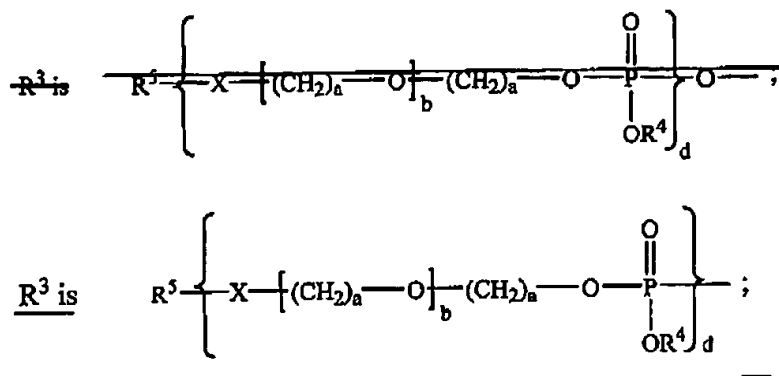


or a salt thereof, wherein:

R² is selected from the group consisting of alkyl comprising at least two carbon atoms, aryl, (R⁸)₃Si- where each R⁸ is independently selected from the group consisting of linear and branched chain alkyl and aryl, base-stable protecting groups, and R⁵-X-[(CH₂)_a-O]_b-(CH₂)_a;

each R¹⁰ is independently selected from the group consisting of hydrogen and R²;

R⁵ is selected from the group consisting of hydrogen, protecting group, reporter molecule, and ligand;



each R⁴ is independently selected from the group consisting of hydrogen and R²;

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each X is independently selected from the group consisting of O, S, NH and NH-C(O);
each a is independently an integer from 1 to 6;
each b is independently an integer from 0 to 40;
each d is independently an integer from 1 to 200; and
OLIGO comprises a sequence-specific nucleobase polymer,
with the proviso that at least one R¹⁰ or at least one R⁴ is other than hydrogen, wherein
the mobility-modifying polymer comprises at least one phosphotriester linkage.

2. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 1 in which each X is O.

3. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 1 in which each a is 2.

4. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 3 in which each b is 4.

5. (Previously Presented) The mobility-modified sequence-specific nucleobase polymer of Claim 1 in which OLIGO comprises a DNA, RNA, DNA analog, or RNA analog oligonucleotide.

6. (Previously Presented) The mobility-modified sequence-specific nucleobase polymer of Claim 1 in which OLIGO comprises an analog of a DNA or RNA oligonucleotide.

7. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 1 in which OLIGO comprises at least one non-negatively charged internucleotide linkage.

8. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 7, wherein said internucleotide linkage is a mono alkyl phosphate triester.

9. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 1 in which R⁵ is a reporter molecule.

10. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 9 in which the reporter molecule is a fluorophore, a chemiluminescent moiety, or a ligand.

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11. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 1 in which OLIGO includes a detectable label.
12. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 9 in which the detectable label is a fluorophore.
13. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 1 in which OLIGO comprises a polyethylene oxide polymer.
14. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 13, wherein the polyethylene oxide polymer is a mono methyl polyethylene oxide polymer.
15. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 13, wherein the polyethylene oxide polymer has a molecular weight of at least 2000 daltons.
16. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 13, wherein the polyethylene oxide polymer has a molecular weight of at least 5000 daltons.
17. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 1, wherein the mobility-modifying polymer is attached to the 5'-end of the sequence-specific nucleobase polymer.
18. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 17, further comprising a polyethylene oxide polymer attached to the 3'-end of the sequence-specific nucleobase polymer.
19. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 18, wherein the polyethylene oxide polymer is a mono methyl polyethylene oxide polymer.
20. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 18, wherein the polyethylene oxide polymer has a molecular weight of at least 2000 daltons.
21. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 18, wherein the polyethylene oxide polymer has a molecular weight of at least 5000 daltons.

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22. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 1, wherein the mobility-modifying polymer is attached to the 3'-end of the sequence-specific nucleobase polymer.

23. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 22, further comprising a polyethylene oxide polymer attached to the 5'-end of the sequence-specific nucleobase polymer.

24. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 22, wherein the polyethylene oxide polymer is a mono methyl polyethylene oxide polymer.

25. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 22, wherein the polyethylene oxide polymer has a molecular weight of at least 2000 daltons.

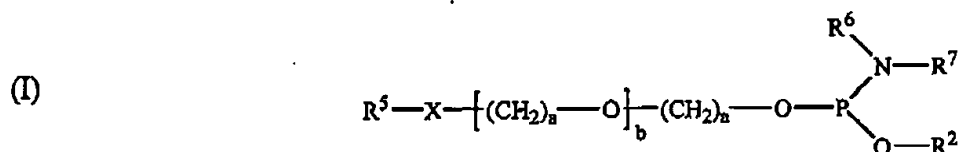
26. (Original) The mobility-modified sequence-specific nucleobase polymer of Claim 22, wherein the polyethylene oxide polymer has a molecular weight of at least 5000 daltons.

27. (Previously Presented) A composition comprising a mixture of different mobility-modified sequence-specific nucleobase polymers, in accordance with Claim 1, wherein each different nucleobase polymer has a distinctive ratio of charge to translational frictional drag relative to the friction drags of the other different nucleobase polymers.

28. (Previously Presented) The composition of Claim 27, wherein OLIGO in each different mobility-modified-specific nucleobase polymer has the same number of nucleobase units.

29-52. (Previously Canceled)

53. (Original) A mobility-modifying phosphoramidite reagent having the structure:



wherein:

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R^2 is selected from the group consisting of alkyl comprising at least two carbon atoms, aryl, $(R^8)_3Si-$ where each R^8 is independently selected from the group consisting of linear and branched chain alkyl and aryl, base-stable protecting groups, and $R^5-X-[(CH_2)_a-O]_b-(CH_2)_b-$;

R^5 is selected from the group consisting of hydrogen, protecting group, reporter molecule, and ligand;

R^6 and R^7 are each independently selected from the group consisting of C_1 - C_6 alkyl, C_3 - C_{10} cycloalkyl, C_6 - C_{20} aryl, and C_{20} - C_{27} arylalkyl;

X is selected from the group consisting of O, S, NH, NH-C(O);

each a is independently an integer from 1 to 6; and

b is an integer from 0 to 40.

54-60 (Canceled)

61. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein R^2 is chosen from ethyl, n-propyl, isopropyl, n-butyl, tert-butyl, and neopentyl.

62. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein R^2 is ethyl.

63. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein R^2 is n-propyl.

64. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein R^2 is isopropyl.

65. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein R^2 is n-butyl.

66. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein R^2 is tert-butyl.

67. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein R^2 is neopentyl.

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68. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein each R^{10} is independently chosen from hydrogen, ethyl, n-propyl, isopropyl, n-butyl, tert-butyl, and neopentyl.

69. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein each R^{10} is independently chosen from hydrogen and ethyl.

70. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein each R^{10} is independently chosen from hydrogen and n-propyl.

71. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein each R^{10} is independently chosen from hydrogen and isopropyl.

72. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein each R^{10} is independently chosen from hydrogen and n-butyl.

73. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein each R^{10} is independently chosen from hydrogen and tert-butyl.

74. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein each R^{10} is independently chosen from hydrogen and neopentyl.

75. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein each R^4 is independently chosen from hydrogen, ethyl, n-propyl, isopropyl, n-butyl, tert-butyl, and neopentyl.

76. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein each R^4 is independently chosen from hydrogen and ethyl.

77. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein each R^4 is independently chosen from hydrogen and n-propyl.

78. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein each R^4 is independently chosen from hydrogen and isopropyl.

79. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein each R^4 is independently chosen from hydrogen and n-butyl.

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80. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein each R^4 is independently chosen from hydrogen and tert-butyl.

81. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 1 wherein each R^4 is independently chosen from hydrogen and neopentyl.

82. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 53 wherein R^2 is chosen from ethyl, n-propyl, isopropyl, n-butyl, tert-butyl, and neopentyl.

83. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 53 wherein R^2 is ethyl.

84. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 53 wherein R^2 is n-propyl.

85. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 53 wherein R^2 is isopropyl.

86. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 53 wherein R^2 is n-butyl.

87. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 53 wherein R^2 is tert-butyl.

88. (New) The mobility-modified sequence-specific nucleobase polymer of Claim 53 wherein R^2 is neopentyl.